ISA I/O Card

User's Guide

Important Note!

In order to minimize possible installation problems and/or resource conflicts:

Read Me First!

About This Manual

This manual is designed to assist users in installing their ISA I/O Card. Information in this document has been carefully checked for accuracy; however, no guarantee is given as to the correctness of the contents. The information contained in this document is subject to change without notice.

Edition

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Radio Frequency Interference

The Federal Communications Commission Radio Interference Statement includes this warning:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of these measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user should not modify or change this device without written approval from U.S. Offshore Co., Ltd. Modification could void authority to use this equipment.

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Chapter 1

INTRODUCTION

Congratulations on purchasing your ISA I/O (Input/Output) Card. This User's Guide is written to provide an easy-to-read yet thorough reference for installing your ISA I/O Card Software driver. Before installing device drivers, browse the Driver CD-ROM Disk to familiarize yourself with its contents. For Hardware installation, your ISA I/O Card's Hardware Guide will provide reference to the instructions in Chapter 2.

NOTE: Before installing your ISA I/O Card, take a few moments to read the first two chapters of this manual and jot down the pertinent information in the Pre-Hardware Installation Checklist section.

Release Notes

- The ISA I/O Card driver is located on your Driver CD-ROM Disk (where "D:" is the designated drive letter: D:\ISA\).
- ISA I/O Card serial ports can support autoflow control and up to a baud rate of 921,600Kbps, except under Windows NT with COM1-COM4 (3F8h, 2F8h, 3E8h and 2E8h).

Chapter 2

BEFORE YOU GET STARTED

Unpacking the ISA I/O Card

Open the product's package and inspect the contents. If any of the items listed below are damaged or missing, please contact your dealer.

1. Your ISA I/O Card
2. This User's Guide
3. Your ISA Hardware Guide
4. Driver CD-ROM Disk
5. One or more Cable/Bracket Assemblies (for some models only)
6. External Serial or Parallel Splitter Cable (for some models only)

Other Items Needed

In addition to the contents of the package, you may need one or more of the following:

1. Your computer's documentation
2. Your operating system's documentation
3. The documentation of the peripheral that will be accessing your new ISA I/O Card
4. A small to medium sized Phillips and/or flathead screwdriver
5. A small container for storing screws

System Requirements

- 75MHz or Higher CPU (Recommended)
- An Available 16-bit ISA Slot
- 32MB of RAM Recommended
- Windows 95, Windows 98 and Windows NT

Driver Support

Your ISA I/O Card comes with a comprehensive Driver CD-ROM Disk which supports the following popular systems:

- Windows 95
- Windows 98
- Windows NT

NOTE: Driver information is subject to change. Check with your dealer for updated driver information.

General Layout

Before continuing, take a moment to familiarize yourself with your new ISA I/O Card's general design. Use the product picture provided in the Hardware Guide to locate the port(s), Cable/Bracket Assembly Jumper(s) and ISA connector.

Pre-Hardware Installation Checklist

Before installing your ISA I/O Card into your computer, refer to the section below and to your Hardware Guide. Remember to fill in your I/O card's Serial number, Model Number, IRQs and I/O Addresses. Doing so will make your software installation go smoothly.

Serial Number

Locate the product's serial number (usually on the back of the card) and record the number below. If the product does not have its original serial number attached, your warranty may be voided.

Serial Number (S/N): _____

Verification of Your ISA I/O Card's Model Number

Each ISA I/O Card is given a unique model number based on the design and performance of the card. To determine your card's model number, check your ISA I/O Card for a 4-digit-and-1-letter model number sticker adhered to the card (E.G., 4001A). Make sure you jot this information down below.

ISA I/O Card Model Number: _____

Verification of Available IRQ Resources

NOTE: Always check your system before installing your ISA I/O Card in your computer to verify that you have an available IRQ to assign to your card.

The port(s) on your ISA I/O Card must be configured to a unique IRQ (Interrupt Request). When your ISA I/O Card is installed you must set the jumper settings to a unique IRQ. Before assigning IRQs, you would be well advised to check your current resource assignments as well as any documentation that came with your computer and/or peripherals for information regarding IRQs that may already be in use.

Software Verification of Available IRQ Resources

To Check your IRQ settings via Windows 95/98, follow the steps below.

1. Click the Windows **Start** button. Go to *Settings*, then *Control Panel*.
2. From the **Control Panel**, double click the *System* icon.
3. From the **System Properties** window, click the *Device Manager* tab, then double click the *Computer* icon.
4. A **Computer Properties** window will appear with a list of your assigned IRQs. Any of the following IRQ assignments within the following range may be used for your card: 3, 4, 5, 7, 9, 10, 11, 12, 15. In the event you do not

have an available IRQ, you will need to disable one of your system's devices in order to free up an IRQ.

Verification of Available I/O Address Resources

Each port on your ISA I/O Card must be assigned a unique I/O Address. It is important that the addresses do not conflict with addresses already assigned to devices on your computer. Overlapping address assignments can cause device conflicts. Checking your current resource assignments as well as any documentation that came with your computer and/or peripherals will help insure that you do not run into any problems. If you're not sure about which I/O addresses to assign, use the default settings charted in the *Configuration* section of your Hardware Guide.

Software Verification of Available I/O Address Resources

Follow the instructions below to verify your current I/O addresses.

1. Click the Windows **Start** button. Go to *Settings*, then *Control Panel*.
2. From the **Control Panel**, double click the *System* icon.
3. A **System Properties** window will appear. From the *Device Manager* tab, highlight "Computer," and then click the Properties button.
4. A **Computer Properties** window will appear. By default a list of already assigned IRQs will be displayed. Click the "Input/output (I/O)" radio button. A list of already assigned I/O Addresses will be displayed. Of these addresses, the I/O Addresses not listed in the **Computer Properties** window are the available I/O Addresses you may assign. Please check your ISA Hardware Guide to verify that the I/O Addresses listed on the Hardware Guide are available on your computer, i.e., not listed in the Computer Properties window.

Verify and Record Your ISA I/O Card's IRQ and I/O Address Jumper Settings

Before installing your ISA I/O Card, confirm which IRQ and I/O Addresses are available on your system. If the default jumper settings on your card match available IRQ and I/O Addresses in your system, you are ready to insert the card into an available ISA bus slot. If the default jumper settings are already in use on your system you must reset the conflicting jumpers on the card to match available IRQ or I/O Addresses. Please record these settings in the following ISA I/O Card Jumper Settings Table for reference during software installation.

Serial Port No.	IRQ Jumper Setting	I/O Address	Parallel Port No.	IRQ Jumper Setting	I/O Address
S1			P1		
S2			P2		
S3			P3		
S4					
S5					
S6					
S7					
S8					

Chapter 3

SOFTWARE INSTALLATION

After installing your ISA I/O Card, you'll need to install a software driver. This chapter presents general software installation instructions for the following popular systems: Windows 95, Windows 98 and Windows NT.

Your driver information is located at the following path on your Driver CD-ROM Disk: D:\ISA\ (where "D:" is your designated CD-ROM drive).

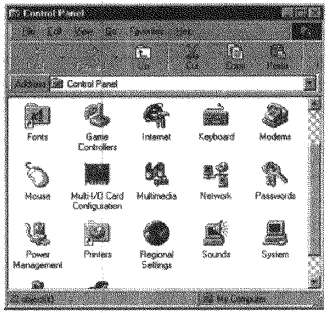
NOTE: Before installing any software please insure that all hardware is properly configured and installed according to the instructions in your Hardware Guide. A Pre-Hardware Installation Checklist is provided in chapter 2 to help ensure the successful installation of your software.

Windows 95 and Windows 98

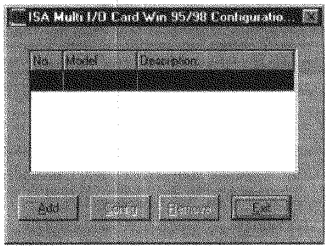
Follow the instructions below to install your ISA I/O Card driver under Windows 95 and Windows 98.

1. When you are sure that your ISA I/O Card is properly installed, start Windows.
2. After Windows starts up, insert your Driver CD-ROM Disk into your CD-ROM drive.
3. Click on your Windows **Start** button. Then select *Run*.
4. A **Run** window will open. Click on the *Browse* button.
5. From the **Browse** window, locate your CD-ROM drive letter and double click it. A group of folders will appear.
6. Double click the "Isa" folder, then double click the folder that corresponds with your operating system (e.g., "Win_95" or "Win_98"). Double click *Setup.exe*.
7. You will be returned to the **Run** window. Under *Open:* it should read "D:\ISA\WIN_9X\Setup.exe" (Where D: is your designated CD-ROM drive letter). Click *OK*.

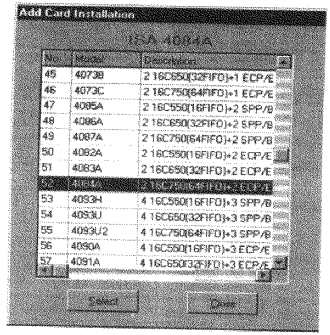
8. A setup application will be launched. At the **Welcome** screen click *OK* and then at the second screen click *Next*.
9. When Setup has finished an **Information** window will appear. Click *OK*. To complete the setup process, click the *Finish* button.
10. After setup is finished, click on your Windows **Start** button. Click *Settings* and then click *Control Panel*.
11. Your **Control Panel** will open. Double click the *Multi-I/O Card Configuration* icon.



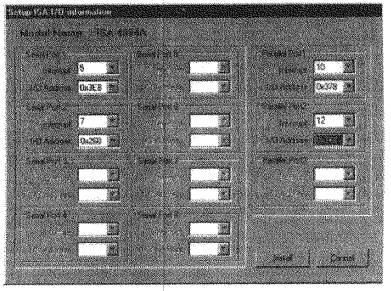
12. An **ISA Multi I/O Card Windows 95/98 Configuration** screen will appear. Click the *Add* button.



13. An **Add Card Installation** window will appear. Use the scrolling bar to find the model number of your ISA I/O Card. Please refer to the "Pre-Hardware Installation Checklist" section in Chapter 2 to identify the correct model.
14. Select the correct model number of your I/O card and then click the *Select* button.



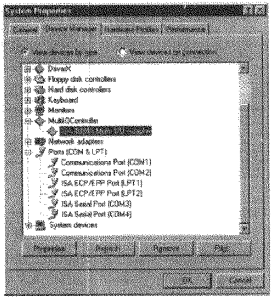
15. A **Setup ISA I/O information** screen will appear. Depending on your card, use the drop–down boxes to select your interrupt setting (IRQ) and your I/O Address for all ports. Refer to the "Verify and Record Your ISA Card's IRQ and I/O Address Jumper Settings" section in Chapter 2 to fill in the interrupt (IRQ) and I/O Address values for each port. When finished, click the *Install* button.



16. After installation has been completed, Windows will prompt you to restart your computer. Click *Yes* to restart.

Verifying Installation Under Windows 95 and 98

1. To test that your card was installed properly, click on your Windows **Start** button. Click *Settings* and then click *Control Panel.*
2. A **Control Panel** window will open. Double click the *System* icon.
3. A **System Properties** window will appear. From the *Device Manager* tab, locate the *MultiIOController* icon and double click it.



4. Your ISA I/O Card will be listed. Double click the icon.
5. A **Properties** window will appear. Under *Device status* it should read "This device is working properly. Click *OK* to continue.
6. From the *Device Manager* tab in your **System Properties** window, go to *Ports (COM & LPT)* and double click the icon. A listing of COM and LPT ports will appear. Double click the appropriate ports one-by-one or click once on the icon and click the *Properties* button. A **Properties** window will appear. Under *Device status* it should read "This device is working properly."
7. Click the *Resources* tab. Under "Resource type" your card's assigned IRQ and I/O addresses will be listed. Under "Conflicting device list" it should read "No conflicts."

NOTE: After installing ISA I/O Cards, always check your Device Manager to see if installation was successful or not. If installation was unsuccessful, a yellow question mark will appear next to the device icon in the Device Manager screen.

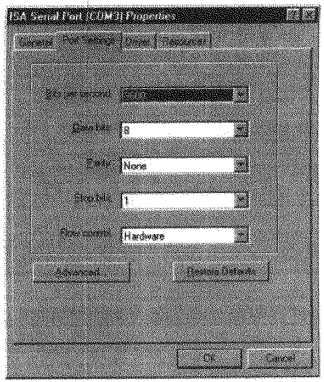
Configuring Your COM Port in Windows 95 and 98

If you'd like to make changes to your ISA I/O Card's configuration, follow the steps below. Default values are pre-set by the computer: Only experienced users should attempt to make changes to the default settings.

Warning: Tampering with your default values could render your computer inoperable. Before attempting to adjust your default settings, make a note of the original default values. If your changes render your computer inoperable, restore the original default values.

1. Click on your Windows **Start** button. Click *Settings* and then click *Control Panel.*

2. A **Control Panel** window will open. Double click the System icon.
3. A **System Properties** window will appear. From the *Device Manager* tab, locate the *Ports (COM & LPT)* icon and double click it.
4. Underneath *Ports (COM & LPT)* your newly installed ISA I/O Card device(s) will be listed. Double click the appropriate ISA Serial (COM) device.
5. A **Properties** window will appear. Click the *Port Settings* tab.



6. From the **Port Settings** tab, if you want to make changes to the default values, use the drop down boxes to configure the *Bits per second*, *Data bits*, *Parity*, *Stop bits* and *Flow control*.

   There are three kinds of Flow Controls: Xon/Xoff, Hardware and None. "Xon/Xoff" refers to software protocol control. "Hardware" refers to RTS/CTS control, but RTS/CTS is actually controlled by software. "None" means there is no defined flow control.

7. Click the *Advanced* button if you want to set more advanced features.
8. An **Advanced Port Settings** window will appear. From this window you can enable the Auto CTS/RTS Flow Control, configure the FIFO settings, and configure the Receive/Transmit Buffer level if you want to further customize the port.

Enable Auto CTS/RTS Flow Control

Enable Auto CTS/RTS Flow Control means the CTS/RTS flow is controlled by hardware automatically. Your System will be more stable if this function is enabled.

16 Byte FIFO Buffers

If your card supports a 32-byte FIFO, you can use either a 16 or a 32-byte FIFO. If your card supports a 64-byte FIFO, you can select 64, 32 or 16-byte FIFO. The default value is 16-byte FIFO.

Receive Buffer/Transmit Buffer

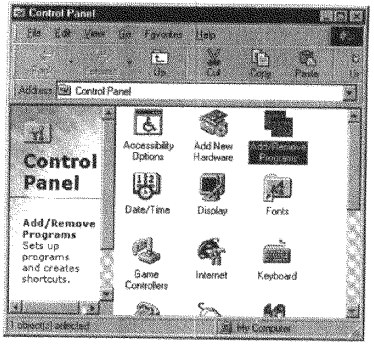
Setting the Receive/Transmit Buffer to a higher value will provide faster performance because the interrupts will be reduced, and the time for the interrupt service routine will be lessened. A receive buffer overflow will occur if the CPU speed is too slow to handle the overflow. If the system is not stable, select the lower value to correct the problem. Click the *Defaults* button to return to your default settings.

NOTE: When configuring LPT addresses higher than LPT4, only use the Windows NT or Windows 98 "Standard I/O Serial or Parallel Port Driver."

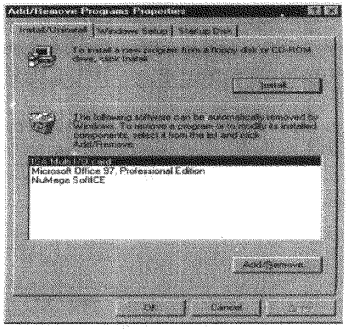
Uninstalling Drivers Under Windows 95 and Windows 98

Follow the instructions below to uninstall your ISA I/O Card in Windows 95 and Windows 98.

1. Click your Windows **Start** button. Go to *Settings* and then *Control Panel*.
2. From the **Control Panel** window, double click the *Add/Remove Programs* icon.



3. An **Add/Remove Programs Properties** window will appear. Select *ISA Multi-I/O Card*. Then click the **Add/Remove** button.



4. A **Confirm File Deletion** window will appear. Click *Yes* to remove the *ISA Multi-I/O Card* driver.
5. Windows may ask you if you want to restart your computer. After uninstalling drivers it's always a good idea to restart your computer. Click *Yes* to restart.

Windows NT 4.0 Driver Installation Guide

To install your ISA I/O Card under Windows NT 4.0, follow the instructions below.

1. When you are sure that your ISA I/O Card is properly installed, start Windows NT.
2. After Windows NT starts up, insert your ISA I/O Card Driver CD into your CD-ROM drive.
3. Click on your Windows **Start** button. Go to *Programs* and then *Windows Explorer*.
4. From **Window Explorer** under *All Folders*, click on your CD-ROM drive letter (Usually Drive letter D:).
5. Double click the "ISA" folder, then double click the "WIN_NT" folder. A list of items in your ISA I/O Card Driver disk will appear on the right. Double click the *Setup.exe* icon.

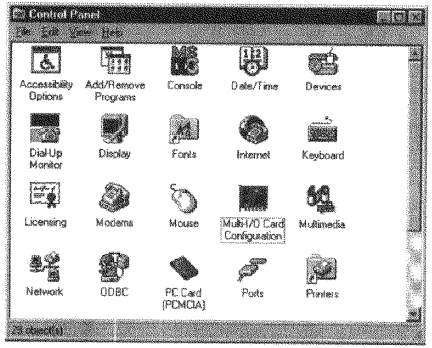
6. At the **Multi-I/O Card Setup** screen, press *Continue* to install the driver.
7. Click *OK* to reboot your computer and load the newly installed driver to NT.

Configuring Your ISA I/O Card In Windows NT

To configure your ISA I/O Card in Windows NT, follow the instructions below.

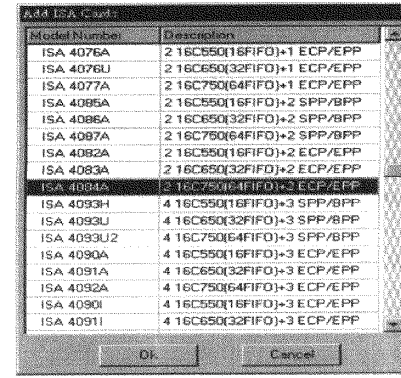
NOTE: When configuring LPT addresses higher than LPT4, only use the Windows NT or Windows 98 driver. Do not use the driver that came with your peripheral.

1. Click on your Windows **Start** button. Click *Settings* and then click *Control Panel.*
2. Your **Control Panel** will open. Double click the *Multi-I/O Card Configuration* icon.

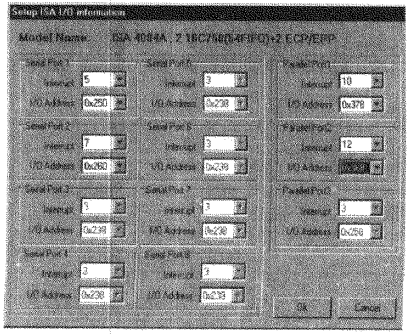


3. A **Multi-I/O Configuration Utility** window will appear. From the *ISA Multi-I/O Setup* tab, click the Add button.

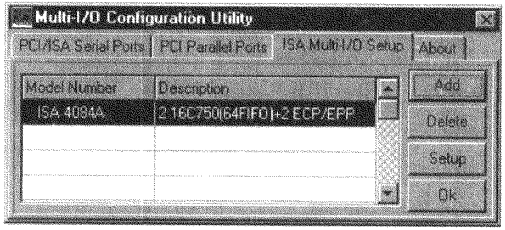
4. An **Add ISA Cards** window will appear. Use the scrolling bar to find the model number of your ISA I/O Card. Select the correct model number and then click the *OK* button.


Add ISA Cards
Model Number
Description
ISA 4076A 2 16C550(16FIFO)+1 ECP/EPP
ISA 4076U 2 16C650(32FIFO)+1 ECP/EPP
ISA 4077A 2 16C750(64FIFO)+1 ECP/EPP
ISA 4085A 2 16C550(16FIFO)+2 SPP/BPP
ISA 4086A 2 16C650(32FIFO)+2 SPP/BPP
ISA 4087A 2 16C750(64FIFO)+2 SPP/BPP
ISA 4082A 2 16C550(16FIFO)+2 ECP/EPP
ISA 4083A 2 16C650(32FIFO)+2 ECP/EPP
ISA 4084A 2 16C750(64FIFO)+2 ECP/EPP
ISA 4093H 4 16C550(16FIFO)+3 SPP/BPP
ISA 4093U 4 16C650(32FIFO)+3 SPP/BPP
ISA 4093U2 4 16C750(64FIFO)+3 SPP/BPP
ISA 4090A 4 16C550(16FIFO)+3 ECP/EPP
ISA 4091A 4 16C650(32FIFO)+3 ECP/EPP
ISA 4092A 4 16C750(64FIFO)+3 ECP/EPP
ISA 4090I 4 16C550(16FIFO)+3 ECP/EPP
ISA 4091I 4 16C650(32FIFO)+3 ECP/EPP
OK
Cancel

5. A **Setup ISA I/O information** screen will appear. Depending on your card, use the drop–down boxes to select your interrupt setting (IRQ) and your I/O address. Start with Serial Port 1 and/or Parallel Port 1. If your ISA I/O Card has two or more ports, fill in the interrupt and I/O address information for the additional ports. When finished, click the *Install* button.



6. You will be returned to the **Multi I/O Configuration Utility** screen. Your ISA I/O Card's model number and description should be displayed. Click the *Add* button to install another card. Click the *Delete* button to remove the selected card. Click the *Setup* button to view or change the settings of your card. Click *OK* to complete the installation process.



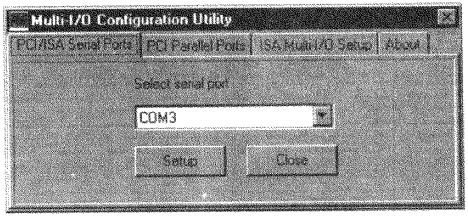
7. You will be asked to restart your computer. After installing new hardware, it's always a good idea to restart your computer. Click *Yes*.

Configuring Your COM Port in Windows NT

If you'd like to make changes to your ISA I/O Card's configuration, follow the steps below. Default values are pre-set by the computer. Only experienced users should attempt to make changes to the default settings.

Warning: Tampering with your default values could render your computer inoperable. Before attempting to adjust your default settings, make a note of the original default values. If your changes render your computer inoperable, restore the original default values.

1. Click on your Windows **Start** button. Click *Settings* and then click *Control Panel*.
2. A **Control Panel** window will open. Double click the *Multi-I/O Card Configuration* icon.
3. A **Multi-I/O Configuration Utility** window will appear. From the *PCI/ISA Serial Ports* tab, under "Select serial port" use the drop-down box to select the appropriate COM port that you'd like to configure. Then click the *Setup* button.



4. A **Setup** window will appear. Select the appropriate settings and then click the *OK* button.

Enable Auto CTS/RTS Flow Control

Enable Auto CTS/RTS Flow Control means the CTS/RTS flow control is controlled by hardware automatically. Your System will be more stable if this function is enabled.

16 Byte FIFO Buffers

If your card can support a 32-byte FIFO, you can select either a 16 or a 32-byte FIFO. If your card can support a 64-byte FIFO, you can select 64, 32 or 16-byte FIFO. The default value is a 16-byte FIFO.

Receive Trigger (Buffer) Level

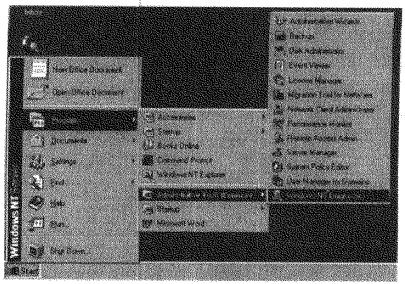
Setting the Receive Trigger (Buffer) Level to a higher value will provide faster performance because the interrupts will be reduced, and the time for the interrupt service routine will be lessened. A receive buffer overflow will occur if the CPU speed is too slow to handle the overflow. If the system is not stable, select the lower value to correct the problem.

NOTE: (1) If you install your modem using auto detect by Windows NT, the Auto flow Control Enable should be unchecked (disabled). **(2)** When serial I/O addresses are set to 3F8, 2F8, 3E8, 2E8 for use in Windows NT, the Standard COM driver can be used and will support up to 115200bps. When using other addresses, using the driver privided on your I/O Card Driver CD can provide support for up to 921600bps. If you install a 4-Port Serial (4S) card, the order of S1-S4 should follow the sequence 3F8, 2F8, 3E8, 2E8; otherwise your system may have difficulty identifying port numbers. **(3)** Under Windows NT, if you assign your ISA I/O Card's I/O addresses to 3F8, 2F8, 3E8 and 2E8, Windows NT will use the Windows NT default driver. If you already have an on-board serial port which is assigned to these addresses and you would like to install an ISA I/O serial card, there may be a conflict. For instance, if you have 2 serial ports already on-board and assigned to 3F8 and 2F8 and then attempt to install a 4-port serial card to 3E8, 2E8, 260 and 268, your system will attempt to install 2 drivers for one card (3E8 and 2E8 will use Windows NT's default driver and 260 and 268 will use the ISA I/O card driver). Thus, in the above situation, use addresses other than 3F8, 2F8, 3E8 and 2E8 to avoid conflicts. Finally, if you do not have an on-board serial port(s), you can set your ISA I/O card's I/O address to 3F8, 2F8, 3E8 and 2E8, but these ports will only run up to 115,200bps; whereas, using I/O addresses other than 3F8, 2F8, 3E8 and 2E8 will require the installation of your ISA I/O card's driver, which supports up to 912,000bps.

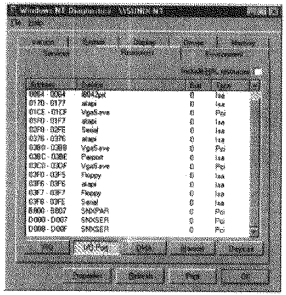
Verifying Your Windows NT 4.0 Installation

To confirm that your Windows NT 4.0 installation was successful, follow the instructions below.

1. Click your Windows **Start** button. Go to Programs, Administrative Tools [Common] and click on Windows NT Diagnostics.



2. A **Windows NT Diagnostic** screen will appear. Click the Resources tab and then click the *I/O Port* button.



3. Verify the I/O addresses of the parallel ports (SNXPAR) and the serial ports (SNXSER) pertaining to your card.
4. Click the *IRQ* button for detailed IRQ information.

Uninstalling Your ISA I/O Card Drivers Under Windows NT

If you are running Windows NT and would like to remove your ISA drivers, follow the instructions below.

1. Click your Windows **Start** button. Go to *Settings* and then *Control Panel*.
2. From the **Control Panel** window, double click *Add/Remove Programs* icon.
3. An **Add/Remove Programs Properties** window will appear. Select *Multi-I/O Card Uninstall*. Then click the **Add/Remove** button.
4. You will be asked to confirm your driver removal. Press *OK* to remove the Multi-I/O Card driver.
5. A Multi-I/O Card Uninstall window will appear. After uninstalling drivers it's always a good idea to restart your computer. Click *OK* to reboot.

Chapter 4

CONNECTING PERIPHERAL DEVICES

Your ISA I/O Card is equipped with one or more ports which can connect to a wide array of peripheral devices.

- If your ISA I/O Card has a parallel port, then it can be connected to color printers, plotters, scanners, Zip drives and MP3 players, to name a few. Some I/O Parallel Cards support ECP protocol, which supports data transfer speeds of up to 21.4MB/sec; whereas EPP/SPP/BPP/PS2 protocols only support data transfer speeds of up to 770KB/sec.

- If your ISA I/O Card has a serial port, then it can be connected to modems, digitizers, bar code readers, ISDN and PDA devices, to name a few.

Connecting a Peripheral to Your ISA I/O Card's Parallel Port

In order to connect peripheral devices to your ISA I/O Card's parallel port, follow the device's installation steps located in the device's User's Manual.

1. Make sure your printer or parallel peripheral device is connected properly to your ISA I/O Card.
2. From your Windows *Start* button, go to *Settings* and then *Printers*.
3. A **Printers** screen will appear. Double click the *Add Printer* icon.
4. Follow the instructions on screen to install your device driver. For more information, consult your peripheral device's User's Manual.

Connecting a Modem to Your ISA I/O Card's Serial Port

1. Make sure your modem is connected properly to your ISA I/O Card.
2. From your Windows Start button, go to *Settings* and then *Control Panel*.
3. Your **Control Panel** will open. Double click the *Modems* icon.
4. Windows will launch an **Install New Modem** wizard. Follow the instructions on screen to install your modem. For more information, consult your modem's User's Manual.

Chapter 5

TROUBLESHOOTING

General Troubleshooting

In the event that you have any difficulties installing your ISA I/O Card, check the following items:

1. Confirm that the card is securely installed.
2. Confirm that the cable connection between your peripheral device and the ISA I/O Card is secure.
3. Make sure that you have restarted your computer. When new drivers have been installed onto your system or when your system resources have been modified, you must restart your computer.
4. Make sure that serial/parallel port addresses and IRQ settings assigned to the I/O Card are not in conflict with other devices already installed on your computer.
5. Make sure your attached peripheral device is powered on.
6. If you are having difficulty installing an Internal Software Modem, first install the Internal Software Modem and then install your ISA I/O Card and driver.
7. If you are still experiencing difficulties, the next step is to contact your vendor.